QUALITY MANAGEMENT PLAN

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QUALITY MANAGEMENT PLAN

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1.0 MANAGEMENT AND ORGANIZATION

The Pastor, Behling & Wheeler, LLC (PBW) Quality Management Plan (QMP or "the plan") defines the company's quality objectives, outlines the systems in place to achieve those objectives, provides guidance to PBW team members in fulfilling their responsibilities, and documents PBW's commitment to quality. The QMP documents management practices, including QA and QC activities. The plan has been prepared in accordance with *EPA Requirements for Quality Management Plans (QA/R-2)* (EPA/240/B-01/002, March 2001). Implementation of the QMP is the responsibility of all PBW employees. Although the company principals are responsible for assuring that the principles and practices of the quality program are followed and implemented at all levels, all project managers have the duty and the authority to consistently apply the program tools within their specific projects.

This QMP is a "living document" and thus is subject to ongoing review and refinement. All PBW team members are encouraged to identify ways to improve the quality of our services and communicate those needs to management for consideration. The Plan will be reviewed at least annually to reconfirm the suitability and effectiveness of the approved quality management practices. All appropriate PBW personnel performing work covered by the scope of the QMP shall be notified of changes to the quality system and the QMP to keep them informed of the current requirements. This practice shall also include active subcontractors for relevant work.

1.1 Quality Assurance Policy

PBW's business mission is based on three guiding principles: client service, employee satisfaction and safety. Client service is built on a foundation of quality work. By exceeding our clients' expectations through our project performance, we are able to build the long-term relationships that ensure the growth and continued success of our company. Consequently, quality assurance and quality control activities are vital to our organization. The general goal of PBW's quality system is to provide a program that ensures that our definition of quality is satisfied on all PBW projects and work products. Toward that end, PBW's policy is to provide all resources needed by the quality system to reach this goal. These resources may include personnel, internal funding, external funding and travel resources as deemed necessary by the QA manager.

1.2 Management Commitment

PBW is committed to providing quality services that meet all of the requirements of our clients, including applicable regulatory requirements. PBW principals are committed to maintaining a positive, diverse and open work environment that encourages continuous improvement and rewards excellence. We recognize that all our team members have different strengths and weaknesses and that our charge as an organization is to empower our people to find opportunities that capitalize on their strengths. We demand integrity in all aspects of our operations and require active participation of all team members and subcontractors in meeting its quality goals.

PBW has implemented a comprehensive Quality Management System (QMS) to ensure that the company's quality objectives are achieved on a routine basis. The PBW QMS described in this QMP applies to all business, technical and administrative functions at PBW. The principles and practices described in this QMP apply to all PBW employees at every level of the company and are fundamental to the services we provide and to the way we do business.

1.3 Organization

The achievement of quality in all activities is the responsibility of each PBW employee and is led by the company principals. As shown on Figure 1, PBW's President serves as the organization's Quality Assurance (QA) Manager. As such, he has the overall responsibility for the implementation of the QMP and for adoption and completion of QA and Quality Control (QC) activities. By establishing the company President as the QA Manager, PBW is able to ensure that the QMS is provided with appropriate resources for planning, assessment and improvement. In most cases, the QA Manager is independent from the personnel directly generating, compiling and evaluating environmental data. In some instances, the QA Manager may be directly involved in those efforts. In these cases, he may appoint another company principal to serve as the QA Manager for those activities.

Each PBW employee has the individual responsibility to perform their job-related duties in a manner consistent with PBW corporate policies and in accordance with corporate and project-specific standard operating procedures (SOPs). Individuals also have the responsibility to bring quality-related issues to the attention of their immediate supervisor or project manager as soon as they are identified.

1.4 Technical Activities Supported by Quality Management System

The technical activities or work processes that are supported by the QMS detailed in this plan include:

- Proposal Preparation / Contracting;
- Project Set-up;
- Data Acquisition;
- Data Analysis;
- Work Product Preparation; and
- Peer Review.

Detailed descriptions of these processes are provided in Section 8 of this QMP.

1.5 Quality Management System Implementation

PBW management is committed to assuring that applicable elements of the QMS are understood and implemented in all environmental programs. As part of PBW's new employee orientation process, all full-time technical employees are provided with a copy of this QMP. The QMP is reviewed with the new employee by the office QA manager and applicable elements to that employee's duties are discussed to assure the employee has an understanding of the program. To assure an ongoing understanding, the QMP is also discussed with each full-time, technical employee, as appropriate, during their annual performance review. An assessment of employee understanding and the implementation effectiveness of the program is included in PBW management meetings, as appropriate.

2.0 QUALITY SYSTEM COMPONENTS

This QMP describes the management system used to provide quality services and discusses the components of the quality system.

PBW's QMS components include:

- Quality System Documentation
- Annual Employee Performance Reviews
- Quarterly Management Assessments of QMS (as appropriate)
- Employee Training
- Project Planning
- Project-Specific Quality Documentation
- Project and Data Assessments

The following tools are available for implementing the QMS:

- Annual Employee Performance Review Forms (including individual employees training plans, as described therein)
- Project-specific Quality Assurance Project Plans (QAPPs)(when developed)
- Peer Review
- Data Verification and Validation (project specific)
- Quality System Audits (management assessments, as appropriate)
- Technical and QA Training (see Section 3.0)

These components of the QMS, and their appropriate uses, are described in this QMP.

Quality assurance is an integrated system of management activities that ensure that a process, product or service meets the needs and expectations of the client and address PBW's mission. At the company level, QA measures promote consistency throughout the firm. At the project level, QA measures guide the definition and implementation of client requirements to produce the desired type and quality of product. These measures may involve planning, implementation, documentation, assessment, reporting and quality improvement. Several key QMS components are described in greater detail below.

2.1 Standard Operating Procedures

In addition to this QMP, PBW maintains corporate SOPs for use on appropriate projects. SOPs provide step-by-step instructions for performing a method or activity. SOPs specify the scope and applicability, detailed methods, QA/QC requirements, documentation and record keeping requirements for each procedure. PBW's SOPs are prepared for company-wide use.

Because the intent of the SOPs is to reflect professional practices, they must be living documents that can be routinely reviewed and updated. Revisions, improvements and updates to a corporate SOP must be reviewed and approved by the company principals. SOPs may be revised as frequently as necessary to maintain their quality. When project-specific SOPs are developed they may be used for their specified scope and are not represented as corporate SOPs. Preparation, peer review, maintenance and control of project-specific SOPs are the responsibility of the Project Manager.

2.2 Peer Review

Peer Review is an integral part of PBW's QMS. Peer review is performed by one or more individuals, typically independent of project work, to evaluate or confirm the adequacy, accuracy and overall quality of the work product. The reviewers are peers of the professional who prepared the work product. Before a final work product is provided to a client, the Project Managers must assure themselves that an appropriate peer review was conducted.

PBW's written peer review procedure is included here as Appendix A. Project Managers will designate peer reviewer(s) at the beginning of the project. The peer review procedures include the following:

1. A method for determination of who is responsible for appointment of peer reviewers;
2. The basic qualifications for peer reviews;
3. The general scope of peer reviews;
4. How it is determined that peer review is not required for a project, and who is responsible for making such a determination; and
5. The procedure to be used for documentation of peer reviews.

The PBW QA Manager shall periodically audit compliance to the peer review procedures. Procedures for audits are presented in Section 9.0 of this plan. More extensive and detailed review procedures may be required in connection with client- or project-specific quality assurance programs.

3.0 PERSONNEL QUALIFICATION AND TRAINING

It is PBW policy that all personnel have the necessary skills and qualifications to perform their work consistent with the company's quality objectives. PBW's qualification and training programs to support this policy are outlined below.

3.1 Qualifications

The necessary knowledge, experience and skills for most positions at PBW are demonstrated by formal academic training. Qualifications of professional employees are documented by resumes that include academic credentials, employment history, experience and any professional registrations.

3.2 QA Training

Each newly hired full-time technical PBW employee first receives QA training via an orientation to the company QMS. The orientation includes a review of the QMP, including peer review, calculation review and data evaluation procedures.

Additional QA training will be provided periodically and shall address relevant regulatory requirements, basic QC practices, responsibilities of the technical and QA staff, and the reporting of nonconformances. In addition, each PBW employee shall become familiar with quality programs by reading the relevant sections of the PBW QMP, policies and SOPs pertinent to his/her position.

3.3 Health and Safety Orientation and Training

Each newly hired full-time technical PBW employee (and certain part-time employees, depending on their duties) is required to go through health and safety orientation and training as per the Corporate Health and Safety Program. The orientation is performed as soon as possible after the employee's report-to-work date. PBW also provides employees with the Health and Safety training that is necessary for their performance of work assignments. PBW's Health and Safety Director maintains employee health and safety training records.

3.4 Professional and Technical Development and Training

PBW encourages company personnel to maintain a high degree of technical skill and knowledge. This is achieved through routine, periodic technical training and development programs such as in-house seminars, and continuing education activities. PBW provides opportunities for training and development and encourages participation in professional associations, conference attendance and skill maintenance. Appropriate ongoing training for employees may include professional, managerial, communication and interpersonal skills, as appropriate. Assessment of the need for additional training is performed annually as part of each employee's Annual Performance Review.

4.0 PROCUREMENT OF ITEMS AND SERVICES

Items and deliverables procured by PBW to support client services or on behalf of a client will be examined upon receipt to ensure that they meet the purchase specifications and that they are operational. The objective of this examination will be to ensure that procured items and services furnished by suppliers and subcontractors are of acceptable quality. As such, the inspection/review will also include an evaluation of the source selected to provide the item/service (as described below) and, as applicable, may include an evaluation of source inspections and supplier audits. Off-specification or defective items, materials and/or deliverables will be immediately returned to the supplier. The Project Manager is responsible for ensuring that an item examinations is performed and that corrective actions are completed, if necessary, to obtain the specified equipment and supplies.

Subcontractors and prospective vendors are selected based upon criteria appropriate to the materials or services provided. The Project Manager or his designee will be responsible for reviewing and approving all responses to subcontractor solicitations to ensure that these responses satisfy all technical and quality requirements.

When procuring subcontractor services, the PBW Project Manager is responsible for assuring that procurement documents (i.e., subcontracting agreements) are reviewed by a PBW principal or authorized designee. Performed in concert with the Project Manager, the goal of this review will be to ensure that procurement documents are accurate, complete and completely describe: the item or service needed; the associated technical and quality requirements; the quality system elements for which the supplier is responsible; and how the supplier’s conformance to the project requirements will be verified.

5.0 DOCUMENTS AND RECORDS

Controlled quality assurance documents include this QMP and the company SOPs. In addition, certain records are completed to provide objective evidence of the performance of an item or process. Document control, record-keeping and record management requirements are described below. Project-related PBW documents shall not be released to a third party without prior and express permission from the client.

5.1 Controlled Document Review and Revision

The corporate QMP will be reviewed annually by the QA Manager and, if necessary, revised and reissued. All revisions to these documents must also be reviewed and approved by the parties listed on their signature pages. Once approved, the revised sections or entire document are distributed to all employees along with a dated cover letter stating that the revised sections replace and supersede previous versions of the document.

SOPs are also controlled documents that may undergo periodic review and revision. The QA Manager will be responsible for ensuring that these periodic reviews are performed. SOP revisions must undergo PBW's peer review process.

5.2 Records Management

A project file is set up and maintained to document the work performed and all communications with the client for that project. Project files should be organized so that the project events can be reconstructed if necessary. It is PBW policy not to retain draft project documents unless requested by the client.

Project managers are responsible for maintaining all hard copy files and managing all electronic files. Electronic files are stored on local-area network system drives that are routinely backed up (rather than on personal hard drives or disks). The project manager is also responsible for establishing and implementing appropriate chain of custody and confidentiality procedures for evidentiary records in accordance with applicable project requirements.

6.0 COMPUTER HARDWARE AND SOFTWARE

Use of computer hardware and software is integral to PBW's operations. This section of the QMP documents procedures for ensuring that computer hardware and software satisfies company requirements and that all computer-related data are accurate, defensible, and secure. These requirements apply to both commercial hardware/software and public domain software, such as EPA's SCRIBE database software.

6.1 Hardware

All computer hardware used by PBW shall be installed in accordance with the manufacturer's recommendations. Computer hardware shall be inspected, cleaned, and maintained, as necessary.

Hardware shall be reasonably secured from theft, tampering and viruses. Security measures include:

- Maintaining firewall protection for systems connected to the public internet;
- Using password-protected network access and logging off systems when not in use; and
- Using and updating anti-virus software to detect and remove viruses.

Computer files will have backup copies made at the following frequencies:

- Local-area Network (LAN) Systems – daily, at a minimum
- Hard Drives on personal computers – as determined necessary by users

6.2 Software

Only software required for PBW business use will be installed on company computers. Software that is not licensed to PBW shall not be loaded on PBW equipment without the approval of a PBW Principal. Changes to software shall be controlled. If the software has had features added, previous test problems should be rerun to demonstrate that their function has not been affected. New test problems

should be processed, as previously discussed, to verify added performance. If the software revision changes the basic operation of the program, complete re-verification of the program is required.

PBW project-specific web pages, portals and ftp sites shall include appropriate password protection. Files downloaded from other ftp and file sharing sites shall be scanned for viruses using the company-approved security software installed on each computer.

7.0 PLANNING

PBW uses systematic planning processes to ensure that data or information collected are of the needed and expected quality for their desired use. These include processes for: (1) planning environmental data operations; (2) developing, reviewing, approving, implementing and revised a QA Project Plan or equivalent document, where required; and (3) evaluating and qualifying data collected for other purposes or from other sources, as necessary.

7.1 Environmental Data Operations

The first step in PBW's environmental data operations planning process is client communication. Each client is assigned a single point of contact, usually a Project Manager, to ensure that there is a strong line of communication between the client and PBW. Project planning is directed by the Project Manager, who is ultimately responsible for ensuring a project is adequately planned, communicated to appropriate personnel and coordinated with other work within the office.

The planning process for environmental data operations typically includes:

- Identifying responsible personnel,
- Stating project goals and data quality objectives,
- Developing a schedule,
- Listing required resources,
- Identifying type and quantity of data needed,
- Specifying data uses,
- Establishing the performance criteria for measuring data quality,
- Designing QA/QC activities to assess the performance criteria,
- Preparing a data collection plan,
- Developing a plan for evaluating data quality and evaluating, and
- Evaluating data from other sources.

7.2 Identification of QA/QC Requirements

QA/QC requirements for a specific project are identified by the Project Manager with assistance from other staff as needed. QA/QC protocols may be described in a Quality Assurance Project Plan or similar planning document as appropriate based on project requirements. The Project Manager is responsible for communicating QA/QC requirements to project personnel, subcontractors and outside-service providers.

8.0 IMPLEMENTATION OF WORK PROCESSES

PBW uses multiple work processes to ensure that data or information collected are the needed and expected quality for their desired use. These activities typically include the following:

1. Proposal Preparation / Contracting;
2. Project Set-up;
3. Data Acquisition;
4. Data Analysis;
5. Work Product Preparation; and
6. Peer review.

Most projects involve all of these activities, although the relative emphasis on and level of effort for each activity may vary considerably. QA elements of these work processes are described below.

8.1 Proposal Preparation / Contracting

After identifying a project opportunity, and obtaining concurrence with the potential client, submission of an oral or written proposal is generally the first step in securing a project. A proposal presents the scope of services, the time schedule and the estimated cost in sufficient detail to meet the objectives of the client.

Once a proposal has been accepted, a contractual agreement is reached between PBW and the client. Only designated PBW personnel have authority to enter into contractual agreements with clients. Agreements may vary from formally executed contracts, proposals accepted and signed by a responsible client representative, letter of intent or, in some cases, documented oral agreements between an authorized PBW employee and a responsible client representative.

8.2 Project Set-Up

Once a contract has been established, the project is assigned a unique identification number (the PBW project number) by the Project Manager. A project file is initiated and maintained during the entire project.

8.3 Data Acquisition

Data acquisition may consist of one or more of the following: literature search (supplemented by personal communications, as appropriate), field investigations, and laboratory tests. Data acquisition methods and procedures may be described in the project proposal, a sampling and analysis plan, work plan, or PBW SOPs. The goal of any data acquisition effort is to obtain results that are objective, representative of actual conditions, repeatable (precise), and of known accuracy. The selection of data acquisition methods should consider cost effectiveness, implementability and the ultimate data uses.

SOPs have been developed for many data acquisition activities to promote consistency in the routine work that is performed within the company. The SOPs describe the scope and applicability, methods, equipment, health and safety protocols, documentation and QA/QC requirements for routine work processes. The SOPs also provide standard forms for recording the information required to adequately document performance of the procedure. SOPs are controlled documents and are distributed and maintained as described in Section 5.0

When subcontractors or commercial laboratories are retained to perform data acquisition tasks, the contractors perform work under the direction of the PBW Project Manager and the Project Manager is responsible for ensuring that applicable procedures are followed and that appropriate documentation of those procedures is delivered to PBW.

When requesting sample analyses from an outside laboratory, PBW typically specifies the laboratory method that will meet a project's data quality objectives. As appropriate, PBW operations use industry- and regulatory agency-recognized analytical methods from source documents published by agencies such as the U.S. EPA, and the American Society for Testing and Materials (ASTM). These procedures are standard to all laboratories and are documented as standard methods that provide data within known accuracy and precision ranges and to known levels of detection and quantification. All

outside laboratories providing sample analyses in support of PBW projects are required to report a method reference.

Documentation associated with data acquisition efforts is retained in project files. This may include: field notes, field forms, chain-of-custody forms, laboratory data packages, and outside references.

8.4 Data Analysis

Data analyses and interpretations are based on logical, systematic procedures. If appropriate to the project, background considerations and technical concepts utilized in each analysis are recorded as the analysis is performed so that the analysis may be reconstructed by a knowledgeable reviewer. Documentation procedures for data analysis tasks are specific to individual projects and will be determined by the Project Manager. All assumptions and computations used to perform data analyses are reviewed by a technically qualified individual.

Some form of data review and data quality evaluation is performed for all laboratory data before it is reported by PBW. At a minimum, analytical results from samples submitted by PBW are checked against the Chain-of-Custody/Request for Analysis form for transcription errors, omissions and gross inaccuracies.

The Project Manager is responsible for all data analysis. Each Project Manager assures himself or herself that the professionals under their responsibility have the required capabilities to analyze the data and develop useful opinions, recommendations and conclusions.

8.5 Work Product Preparation

The Project Manager has the overall responsibility for the quality of all project work products, including reports, memoranda, letters, specifications or drawings. The format, style and complexity of these work products vary, depending upon the nature of the project, the requirements of the client and the preferences of the Project Manager. To help ensure work product quality, the Project Manager may periodically review any interim results, conclusions, and recommendations with the client, both to keep them informed and to obtain their input, whenever deemed appropriate.

8.6 Peer Review

Peer review procedures are described in Section 2.2 and Appendix A of this QMP.

9.0 ASSESSMENT AND RESPONSE

As part of the QMS, PBW has developed an assessment and response program to document how the company will determine the suitability and effectiveness of the QMS and evaluate the quality performance of the environmental programs to which the QMS applies. This section describes the details of the assessment program.

9.1 Audits

Office/project audits are periodically performed to assess compliance with and appropriateness of PBW policies, procedures and standards and evaluate the overall effectiveness of the QMS. These assessments are typically conducted by PBW personnel (usually the QA Manager), but may be also conducted externally by clients and regulatory agencies. Audits can identify areas for improvement, and they provide a means for corrective actions prior to system failure. The following types of audits and assessments may be performed:

- Systems Audits;
- Performance Audits; and
- Spot Assessments.

Internal audits are conducted by the QA Manager, although periodic self-audits may be conducted by the Principals/Office Managers. An individual audit plan should be developed to provide a basis for each audit. This plan may identify the audit scope, activities to be audited, audit personnel, any applicable documents and the schedule. Checklists may be prepared to focus the review process and document the result of the audit.

9.1.1 Systems Audits

The purpose of systems audits is to confirm compliance with the QMP. System audits may be conducted for the following reasons:

1. When significant changes are made in the PBW QMP or other QA documents;

2. When it is necessary to verify that corrective action has been taken on a nonconformance reported in a previous audit;

3. When an additional or a special audit is required by the auditing procedures for a project for which a project-specific quality assurance program has been prepared; and

4. When requested by a Principal/Office Manager or Project Manager.

Audits are performed on the basis of written checklists or lists of questions prepared prior to the audit. Such lists are prepared from the requirements contained in this manual or could be found in a project-specific quality assurance manual, where applicable.

Audits are conducted with an open meeting in which representatives from management, key operational staff, and QA staff participate. The open meeting provides a review of the objectives of the audit and the schedule required to conduct the audit. At the completion of the audit, a debriefing is held to outline the findings, including identification of positive performance, a discussion of future requirements in areas of deficiencies, and to answer questions.

An annual systems audit may be performed under the direction of the QA Manager. This audit is performed to assess each office's adherence to the requirements of the QMP and to assess the status of corrective actions from other audits at that office.

9.1.2 Performance Audits

A performance audit is an independent verification of compliance to a standard or a specific procedure or policy, such as an SOP. The QA Manager typically conducts performance audits. The responsibilities and procedures for performance audits are determined by the QA Manager. Performance audits may be conducted at the request of Principals, Office Managers, and/or Project Managers.

9.1.3 Audit Reports

The lead auditor is responsible for preparing a report detailing the results of the audit. The report is distributed to the Principals, Office Managers and Project Managers, as appropriate. The audit report provides a summary of the audit results with the auditor's comments. Audit findings may include

noncompliant practices, which require corrective action, as well as observations and comments. Noncompliant practices are those practices that are not in compliance with SOPs (when required), plans or corporate policy. Observations may represent isolated instances of noncompliance or questionable practices and should also include positive recommendations for improvement. Comments are considered advice and do not require corrective action.

Observations and comments generated from internal audits do not represent problems that affect quality, but are relayed for information purposes via the initial audit report. Observations and comments do not require corrective action and should not be included in the final audit close-out documentation. It is the responsibility of the Operations Manager at each office to verify implementation of the corrective actions and close all internal audit findings.

9.1.4 Informal Assessments

Informal assessments may be conducted without prior scheduling by the QA Manager or Project Managers. Their scope and frequency will be determined by Project Managers.

An informal assessment may be used to assess a procedure relative to the documented SOP. Such an assessment is conducted by observation of the employees performing the task compared with the documented SOP. In some cases, the assessment may be conducted through interviews with the employee when observation of a task is not possible. Review of relevant documentation for the completed procedure is included in such an assessment. A checklist may be used in conducting the assessment. The results of the assessment are documented, as are the corrective actions. All deficiencies noted as a result of an informal assessment should be corrected by the responsible staff in a timely manner.

9.2 Corrective Actions

Corrective actions are measures taken to rectify quality deficiencies. Corrective actions should be timely and effective at addressing the root cause as well as resultant problems from the deficiency. Whenever a systematic error is discovered that affects the accuracy or defensibility of results reported to PBW's clients, client notification may be part of the corrective action. Corrective actions are implemented with an understanding of the technology and work activities associated with the quality element, with appropriate training or retraining of PBW employees and contractors/vendors. Corrective

actions are monitored for progress and success. Any disputes encountered as a result of the assessment process will be reported to and will be addressed by PBW's QA Manager.

10.0 QUALITY IMPROVEMENT

Quality improvement is a key part of fulfilling our clients' quality expectations and should be the focus of every employee. The QA Manager sets the tone for this effort and is responsible for identifying, planning, implementing, and evaluating the effectiveness of quality improvement activities. All employees are empowered and encouraged to bring suggestions for process improvement changes to the attention of management. Management is responsible for assessing the recommendation for improvement and following through with an implementation plan when appropriate.

QMS processes described in this QMP promote quality improvement by ensuring that conditions adverse to quality are:

- Prevented through staff training and peer review of project deliverables;
- Identified through system audits, performance audits and spot assessments; and
- Corrected (including documentation of corrective actions and tracking to closure) through the audit reporting and post-audit corrective action process.

An important element of all of these processes is the open and frequent communication between all PBW members and between PBW and our clients. Project Managers are encouraged to provide continuous feedback to all employees regarding performance measures and standards. Understanding the processes that our clients value is critical to meeting our definition of quality.

APPENDIX A

PEER REVIEW PROCEDURE

PEER REVIEW PROCEDURE

Pastor, Behling & Wheeler, LLC

1.0 INTRODUCTION

The purpose of this peer review procedure is to describe the requirements and procedures for the performance and audit of peer review activities of PBW. This document is an integral part of the PBW Quality Management Plan. It is applicable to all PBW personnel and outside consultants who support a PBW project.

1.1 Review Policy

To assure that the desired quality of services is maintained, PBW has adopted the following policy:

> Peer reviews shall be conducted on all projects to provide assurance that the quality of services is in accordance with the standards of the profession and the objectives and terms of agreement between PBW and a client. Peer reviews are performed by an engineer, geologist or other professional who is considered a peer of the person from whom the work originated.

A peer review shall be made for all projects prior to submission of the final work product.

2.0 PEER REVIEW PROCESS

The peer review process, including lines of individual responsibility, qualifications of the peer reviewer and accountability, is defined below.

2.1 Initiation and Verification of Review

The Project Manager responsible for a project assures that one or more peer reviewers are assigned to the project, the scope of the review to be conducted is specified, the review is conducted as

specified, the results of the review are documented and any differences between the originator and the reviewer are resolved and the results documented. The frequency of reviews during the project work will depend on the complexity and duration of the project and the number of technical fields involved.

2.2 Qualifications of Reviewer

A peer reviewer shall possess the technical qualifications, practical experience and professional judgment considered by the Project Manager as being adequate to conduct the peer review. The peer reviewer shall not have been involved with the technical production or supervision of the work to be reviewed.

2.3 Scope of Review

The peer review includes a critical evaluation of the basis and validity of all significant conclusions, opinions, assumptions, evaluations, recommendations, designs and other items that are required as an end result of the project services. It emphasizes establishing the validity of the technical approach and other procedures used to form an opinion of the suitability of the end result. The peer review does not necessarily include a complete check of detailed calculations, but does include verification that checking of calculations has been adequate.

Upon completion of the peer review, the Project Manager shall discuss the reviewer's comments with the reviewer, and shall attempt to resolve any significant issues. Any unresolved issues shall be referred to the appropriate Company Principal.

3.0 AUDITING

As appropriate, the QA Manager shall periodically conduct a performance audit to verify the proper conduct of the peer review procedures specified herein. Procedures for audits are covered in Section 9.0 of the PBW Quality Management Plan.